HISTORY

COLLEGE OF MEDICINE

1958-1968

# CHAPTER 10

# DEPARTMENT OF OPHTHALMOLOGY

Ted Suie, Ph.D.

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## I. GENERAL

During the past 10 years significant growth and progress occurred in the Department of Ophthalmology. The staff increased from 31 to 44 in number, additional space became available and the patient load (in-patient and out-patient) increased significantly. In 1962 Dr. Torrence Makley became chairman of the department succeeding Dr. William Havener who remained in the department as a geographic full-time staff member. During the period Dr. Arthur M. Culler, Chairman of the department from 1947 to 1959, died, closing an era of marked progress within the department (see Vol. II, The Ohio State University, College of Medicine 1934-1958).

Advances in ophthalmology during the past decade necessitated the re-organization of the department into sub-specialty clinics each headed by a staff member who has an interest in a particular aspect of ophthalmology. This has permitted the introduction of several new and valuable teaching rotations for the residents. In addition, the residency program was expanded to permit appointments of five residents a year, thus allowing fifteen residents to rotate through a three year service. With the availability of National Institute of Health fellowships, a four year program was established in 1967 to allow the training of teacher-investigators.

Dr. Richard Keates came to us in 1964 from Wills Eye Hospital in Philadelphia to head the Cornea Service and the newly formed Eye Bank. In 1967, William Biersdorf, Ph. D. joined our faculty as director of a new electro-physiology laboratory thus opening an entirely new

area for research in blinding diseases. Dr. Martin Lubow, formerly Chief of Ophthalmology Service at Fitzsimmons General Hospital, became a member of the department in 1967 and assumed duties as the chief of the neuro-ophthalmology section. The types of the sub-specialties with their directors are listed in Table I below. Detailed functions of the various services will be discussed under patient care.

TABLE I

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| Uveitis | James W. Long, M. D.<br>John D. Stephan, M. D. |
| Retinal | William H. Havener, M. D. |
| Orthoptics | Hans G. Bredemeyer, M. D. |
| Microbiology | Ted Suie, Ph. D. |
| Medical Illustration | David Pixley, M. Sc. |
| Glaucoma | Frederick Kapetansky, M. D.<br>James Andrew, M. D. |
| Eye Pathology | Torrence Makley, M. D.<br>Joel G. Wachtel, M. D. |
| Cornea & Eye Bank | Richard H. Keates, M. D. |
| Contact Lens & Prosthesis | Joseph A. Bitonte, B. E. E. |
| Electrophysiology | William Biersdorf, Ph. D. |
| Neuro-ophthalmology | Martin Lubow, M. D. |

In 1967, changes were made in the medical student curriculum. In conjunction with other departments, the Department of Ophthalmology presents a course entitled "Comprehensive Evaluation of the Patient" to the second year medical students in which a series of lectures and demonstrations is presented concerning ophthalmoscope findings as they relate to various systemic disorders. In the third and fourth years students are given a considerable amount of time for electives in advance courses. In 1968, 15 students registered in the department for elective experience. In addition, five students spent time working on research projects pertaining to the eye

under the supervision of our staff members. A series of ten lectures covering various facets of ophthalmology are presented to the entire senior class during the months of October and February. Many of these lectures are semi-programmed permitting a great deal of student participation.

A considerable portion of our teaching effort continues to be directed towards training the ophthalmology residents. The resident training program combines basic and clinical work and includes teaching and research assignments. In addition, a well-rounded basic course is given during the three years each resident spends in his training. These lectures include eye anatomy, physiology, pathology, microbiology, pharmacology, neuro-ophthalmology, and perimetry, medical and surgical ophthalmology, physiologic optics, refraction and dispensing, strabismus and orthoptics. This material distributed over a three year period is equivalent to the intensive basic courses presented at such schools as Harvard or the University of Pennsylvania and has the added advantage of being closely integrated with clinical training.

In 1967 the Master of Science in Ophthalmology degree was approved by the Graduate School. This has enhanced the standards of instruction in the department by providing a highly improved training program especially for those residents wishing to pursue an academic career. Two residents enrolled in the graduate program in 1968.

The following residents received their Master of Medical Science degrees during their residency:

Hans G. Bredemeyer, M. D.
Gilbert Smolin, M. D.
Charles Leon, M. D.
Elmer C. Collins, M. D.
Sanders M. Farber, M. D.
Charles Zepp, M. D.

and Walter Podedwory, M. D.

Doctors Frederick Davidorf and Elson Craig received the M. Sc. degree during this period.

Post-graduate medical education is necessary to keep the physicians aware of new developments in their special fields. Ophthalmology, during the chairmanship of Dr. William Havener, was one of the first departments to recognize this need and became interested in advancing continuing medical education for practioners in this area. The eleventh consecutive post graduate course in ophthalmology was held in March, 1968. Registration for this course now exceeds 125 individuals. Outside speakers as well as our own faculty now attend and are invited to present timely material in one specific area of ophthalmology. We are appreciative of the office of Continuing Medical Education for their help in organizing these post graduate courses.

During this period the recognition for the need of skilled ophthalmic assistants led to the establishment of an annual course in perimetry. Every two years the department presents a contact lens seminar with guest speakers presenting the latest concepts in the optical and mechanical skills required for the fitting of these lenses.

With a special fund made available from the College of Medicine, we are able to invite a number of visiting professors of national stature each year to cover material in special areas of ophthalmology. These lectures are attended by medical students rotating through the department, residents, faculty and all other interested physicians.

Members of the department have also participated actively in lecturing to various other schools and colleges both on an undergraduate level and on a graduate level.

The Orthoptic Course instituted in 1958 has prepared a total of 10 students to assist ophthalmologists in the care of patients whose eye muscles are not properly co-ordinated. A geographic full-time staff member as head of the service and trained orthoptists has made this area a strong contributor of our patient care and teaching program.

## II. Patient Care

During the past 10 years the number of out-patient visits to the Eye Clinic, the Children's Hospital and other hospitals affiliated with our training program, including Dayton V. A. Hospital has increased by nearly 2,000 (from 14,600 to 16,000). A major increase occurred in the number of surgeries performed by the resident staff and attending staff. In 1958, a total of 530 major surgeries were performed as compared to 1584 in 1968. The specialty clinics organized during the past 10 years have been invaluable for patient care, teaching, and research. The uveitis survey service in the seven years since its inception in 1962, has surveyed 833 patients. The relatively new specialty clinic has given us a wealth of material for studying various aspects of this very important disease. The uveitis team, consisting of Drs. Torrence A. Makley, James W. Long, John D. Stephan, and Ted Suie are continuing their studies of uveitis from both a basic and clinical approach as discussed later in this chapter.

The Glaucoma Clinic has expanded during the past four years. Dr. Frederick M. Kapetansky has continued to maintain an active clinic on Friday mornings. Not only is the diagnosis and treatment of glaucoma stressed, but newer instruments which are available are constantly employed in the clinic. Areas of increasing interest include gonioscopy, applanation tonometry, and tonography. In addition, the glaucoma consultation service for evaluating referred complicated glaucoma patients had its inception three years ago under the supervision of Dr. Kapetansky and Dr. James M. Andrew.

Because of the rapid growth of the ophthalmic pathology laboratory, Dr. Joel G. Wachtel joined Dr. Makley as co-director of this service in 1965. Over 600 accessions each year are recorded and makes this laboratory a valuable rotation for all eye residents as part of their training program.

The microbiology laboratory under the supervision of Ted Suie, Ph. D., has been in existence for sixteen years. Numerous publications of the field of eye microbiology and immunology have resulted from investigations conducted in this area. Basic immunologic concepts have been utilized to determine more precisely the mechanisms involved in naturally occurring uveitis. In addition to research, all diagnostic tests for ocular infections and allergies are performed in this laboratory. The residents are given a three month course every three years in ophthalmic microbiology which includes basic bacteriology, mycology, virology, and immunology.

The Corneal Service Clinic had its inception with the arrival of Dr. Richard Keates in 1964. This service has continued to develop during the past several years and the number of corneal transplants performed at University Hospital increased many times over in preceding years. A wide variety of corneal diseases are now being referred to the corneal service. This clinic has been an invaluable adjunct to resident and student teaching. Each resident receives instructions in the use of the operating microscope and the techniques of corneal transplantation. The eye bank has shown a marked increase in the number of eyes received during the past four years. The bank has aided smaller communities in their efforts to establish eye banks or substations of the Ohio State University Eye Bank.

The Retinal Service, instituted during the past ten years and under the direction of Dr. William H. Havener, has the objectives to teach residents in becoming skilled in the use of the indirect ophthalmoscope, knowledge of the appearance of peripheral retina and to become proficient in the management of retinal detachments. Five second year residents rotate through the retinal service each year. In addition to surgical experience, a series of didactic lectures are presented concerning all phases of retinal disease.

## III. Physical Facilities

In 1966, the eye clinic area was renovated in order to facilitate out-patient care. Now each resident rotating through the clinic is provided with a private office, treatment room, and refracting lane.

Ophthalmology was the first service to move into Means Hall (formerly Tuberculosis Hospital) in 1967. This increased our in-patient capacity by fourteen beds. Also, the two operating rooms are used exclusively for eye patients. At the present time the space is being renovated in Means Hall so that offices and laboratories of the department can also be located in the facility.

The great expanse of space for research, teaching, and patient care in ophthalmology will take place when the concept of the Eye Center at Ohio State University becomes a reality. This center will provide the most up to date patient care, be dedicated to research to prevent blindness and be a teaching facility equal to the best in the country.

During the past ten years we have been able to purchase the latest equipment through private donations and federal and state monies. Among the sophisticated equipment purchased are a laser, a cryotherapy unit, fluorescent fundus camera, a surgical microscope, and a photocoagulator. In addition, we were able to fully equip the orthoptic clinic, the microbiology and immunology laboratories, electrophysiology laboratory and eye pathology laboratory.

## IV. RESEARCH

A great proportion of the efforts of the Department of Ophthalmology is directed toward the finding of causes and methods for treating blinding diseases. It is our hope that through such studies the future incidence of blindness and eye disability will be reduced.

Uveitis, a major cause of blindness in the United States, has been the greatest area of research interest for the past ten years. Basic studies have included the determination of production of antibodies in the aqueous humor in experimental uveitis resembling naturally occurring uveitis and more recently the findings of an increase of anti-DNA substances in sera of individuals with uveitis. Clinically, we have confirmed and extended the findings of others that Histoplasma capsulatum is a significant etiologic agent in uveitis especially in the mid-west area of the United States. In fact, the majority of patients referred to our Uveitis Clinic are diagnosed as having presumed histoplasmin desensitization. A summary of our work was presented to the American Academy of Ophthalmology and Otolaryngology at the national meeting in 1964.

In 1959 we were fortunate in obtaining a light coagulator with funds donated to Operation Eye Research. This instrument can focus precisely with a light beam so intense as to seal retinal tears or destroy intraocular tumors. By obtaining this instrument soon after its discovery we were able to pioneer in its use in treatment of retinal detachments and neoplasms. During the past year we purchased a laser which has certain advantages over the more cumbersome light coagulator and which will probably become the instrument of choice.

Excellent studies were made and published concerning the fine structures of photoreceptor cells of the human retina using the electron microscope. Part of this long-term study involved the determination of the localization of glycogen and enzymes in the retina using newer histochemical

techniques. Using these methods we hope to clarify the role of certain enzymes in the conversion of nerve energy at the photoreceptor at the cell level.

In 1966 with the aid of funds from the Ohio Lions Research Foundation a complete electrophysiology laboratory was builty. This unit is supervised by a full-time biophysicist, Dr. William Biersdorf. A shielded room and recording equipment were installed in University Hospital to record conventional electroretinograms under conditions of single flash and rapid flicker. A technique has been developed for the recording of ERG's from the macular area and is being used for a study of senile macular degeneration. Other ocular conditions being studied with the method include early retinal detachments, hemerlopia, choroideremia, and Leber's disease. Facilities are being developed for the recording of clinic electro-oculograms which gives even earlier evidence of retinal detachment in certain diseases. A laboratory has also been installed at the Ohio State University Research Center, where both research and clinical service is conducted using computer facilities. The use of the computer allows recording of the ERG from the macular area and is presently being used for the study of senile macular degeneration.

Probably the greatest research growth in special services occurred in the corneal service and eye bank during the past decade. Basic research is continuing in finding better methods to preserve corneas for transplantation using quick freeze methods. Animal experimentations are also being conducted to determine if plastic corneal implants are satisfactory

to use in individuals with severely scarred human corneas and who repeatedly reject corneal tissue transplants.

During the past three years several papers were published on mycotic infections of the eye, an increasingly important problem in ophthalmology since the steroids potentiate the growth of fungi and the so-called saprophytes may indeed be pathogenic for the eye. Animal experiments conducted in the department show that certain antibiotics also may potentiate the growth of these fungi in the eye. We have investigated methods for early diagnosis of fungal infections in order that proper anti-fungal therapy may be instituted at once. We have devised a fluorescein tagged antibody method for detecting various species of fungi from corneal scrapping and other ocular material. Another method using acridine orange staining under a fluorescent microscope also may be useful in determining the presence of fungi in smears.

Titles of the projects pursued and being pursued during the past ten years by various members of the department are listed below. Two hundred publications have resulted from these investigations.

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| Study of Flat Preparation of the Retina | J. M. Bloodworth, M. D. |
| Evaluation of Heparin Therapy of Senile Macular Degeneration | William Havener, M. D. |
| Study of the Harrington Multiple Screener in Detection of Eye Disease | William Havener, M. D. |
| Transfer of Activity from Sensory Cells to Nerve Cells | Leo E. Lipetz, Ph. D. |
| Excitation and Inhibition in the Vertebrate Retina | Leo E. Lipetz, Ph. D. |
| Vascular Membranes on the Anterior Surface of the Iris | Torrence Makley, M. D. |
| Intraocular Manifestations of Neurofibromatosis | Torrence Makley, M. D. |
| Anatomy and Histology of the Eye for Veterinarians | Jack Prince, F. D. M. S. (Eng.) |

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| Suppression Amblyopia Studies | Hans Bredemeyer, M. D. |
| Bacteriophage Typing of Ocular Stains of Staphylococci | Ted Suie, Ph. D. |
| Experimental Immunologic Uveitis | Ted Suie, Ph. D. |
| Serology of Uveitis | Ted Suie, Ph. D. |
| Experimental Histoplasmosis of the Eye | Ted Suie, Ph. D. |
| Early Detection of Senile Macular Degeneration | Torrence Makley, M. D. |
| Histopathology of Marfan's Syndrome | Joel G. Wachtel, M. D. and Torrence Makley, M. D. |
| Osmotic Hypotensive Agents in Repair of Penetrating Ocular Injuries | Frederick Kapetansky, M. D. |
| Intraocular Pressure in the Presence of Corneal Guttata | Frederick Kapetansky, M. D. and Richard Keates, M. D. |
| Bacterial Flora of the Conjunctival Sac Before, During, and After Intra-ocular Surgery | Torrence Makley, M. D. |
| Bacterial Studies of Contact Lenses | Frederick Kapetansky, M. D. |
| Experimental Studies on Hyphema | Donald Bollheimer, M. D. |
| Biochemical Analysis of Preserved Cornea | Richard Keates, M. D. |
| Vascular Patterns in Senile Macular Degeneration | Torrence Makley, M. D. |
| Pathologic Studies of the Eyes of Stillborn Infants | Torrence Makley, M. D. |
| X-ray Manifestations of Orbital Tumors | Torrence Makley, M. D. |
| Long-Term Followup of Gliomas of the Optic Nerve | Torrence Makley, M. D. |
| Studies of Factors Involved in Spontaneous Retrogression of Retinoblastoma | Torrence Makley, M. D. |
| Durnal Pressure Variations of Glaucoma Patients in their Home Environment | Frederick Kapetansky, M. D. |
| Studies of Drug Penetration through the Corneas | Richard Keates, M. D. |
| Attempts to Retard Corneal Vascularization | Richard Keates, M. D. |
| Studies of Post-Operative Wound Healings | Richard Keates, M. D. |
| Measurement of Corneal Curves and Thickness with the Corneopter | Joseph Bitonte, |
| Brightness Discrimination in Amblyopia | Hans Bredemeyer, M. D. |
| Changes of Accommodation Induced During Treatment of Convergence Insufficiency | Hans Bredemeyer, M. D. |
| Rapid Desensitization to Histoplasmin | James W. Long, M. D. |
| Evaluation of Newer Antibiotic Drugs on Ocular Bacteria | Ted Suie, Ph. D. |
| Effects of Osmotic Diuretics on the Vitreous | John W. Higbee, M. D. |

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| Electron Microscopy of Human Ocular Tissue | Elson L. Craig, M. D. |
| Ocular Pulse Measurements Using Applanation Tonometry | James Knapp, M. D. |
| Electromyography of the Extra-Ocular Muscles as an Early Means of Detection of Neuromuscular Disease | Gerald Buerk, M. D. and Ernest Johnson, M. D. |
| Tensile Strength of Corneal Wounds | Richard Keates, M. D. |
| Studies of Surgical Adhesives in Corneal Perforation | Duane Diller, M. D. and Richard Keates, M. D. |
| Operant Conditioning of Human Papillary Responses | William Biersdorf, Ph. D. |
| Corneal Prostheses in Severely Destroyed Corneas | Richard Keates, M. D. and Gordon Newman, M. D. |
| Intra-ocular Pressure Dynamics in Diabetic Children | Frederick Kapetansky, M. D. and Leroy Bloomberg, M. D. |
| Immunologic Studies of Fluorescein Sensitivity | Ted Suie, Ph. D. and Richard Keates, M. D. |
| Study of Iris and Choroidal Vasculature by Digestive Techniques | Joel G. Wachtel, M. D. |
| Histochemistry of Corneal Dystrophies | Joel G. Wachtel, M. D. and Torrence A. Makley, M. D. |

The following textbooks by our staff members were published during this period:

Havener, William: "Eye Examination", Chapter 5 in textbook, Physical Diagnosis, (edited by Prior and Sieberstein), 1959 by The C. V. Mosby Co., St. Louis, Missouri

Havener, William: Synopsis of Ophthalmology, 1959 by The C. V. Mosby Co., St. Louis, Missouri

Suie, Ted: Microbiology of the Eye, 2nd edition, 1959 by the American Academy of Ophthalmology & Otolaryngology, Whiting Press, Rochester, Minnesota

Havener, William: EENT for Nurses, (with M. J. Reed and William Saunders) 1963 by The C. V. Mosby Co., St. Louis, Missouri

Havener, William: Ocular Pharmacology, 1966 by The C. V. Mosby Co., St. Louis, Missouri

Havener, William: Atlas of Retinal Detachment, 1967 by The C. V. Mosby Co., St. Louis, Missouri

Bredemeyer, Hans G.: Orthoptics - Theory and Practice, (with Kathleen Bullock), 1968 by The C. V. Mosby Co., St. Louis, Missouri

Keates, Richard: A Manual of Corneal Disease, (with M. Grayson), by Little, Brown, and Co., Boston, Massachusetts (in press)

## V. SUPPORT

Ohio Lions Research Foundation was incorporated in March, 1957, for the purpose of supporting eye research. The concept of the Foundation is to attack through research the basic causes of blindness rather than paying endlessly for the newly blinded person. Since its inception the Lions have given the department approximately $10,000 a year for pilot studies in various facets of basic and clinical research into the causes of blindness. In 1967, a grant of $20,000 made it possible to establish a complete electrophysiology laboratory.

Also, in 1957, Operation Eye Research, a division of the Development Fund was established by Mr. Milton Staub in recognition of the skilled patient care rendered by the Department of Ophthalmology. Donations to this fund are used for research and development in the field of eye care. Since its inception, $58,098 has been given to this fund by individuals interested in research of blinding diseases.

Two extended training grants received during the past decade from the National Institute of Health ($38,476/per year) have provided an invaluable financial support for resident teaching and support. In addition,

the NIH General Support Funds from the College of Medicine has given us financial support for pilot studies in various aspects of blinding diseases. In 1968, the expenditure of the Department for eye research, including our training grant, was over $68,000. This includes $8,300 from a grant to study the site of light adaptation in the human retina by U.S. Army Medical Research and Developmental Command.

The Samuel J. Roessler Memorial Fund administered by the College of Medicine has been extremely helpful in providing funds for medical students interested in conducting eye research during their "off-quarters".

## VI. FACULTY BIOGRAPHIES

ANDREW, JAMES M.
A. B., Dartmouth Coll. 1945; M. D., Long Island Coll. of Med. 1947; Instr. 1952; Asst. Prof. 1954; Assoc. Prof. 1959 -

BATTLES, MORRIS L.
B. A., O. S. U. 1938; M. D., O. S. U. 1941; Instr. 1949; Asst. Prof. 1955; Assoc. Prof. 1961 -

BIERSDORF, WILLIAM R.
B. S., Washington S. U. 1950; M. S. Washington S. U. 1951; Ph. D. U. of Michigan 1947; Research Prof. 1958 -

BONTLEY, JACK R.
B. S., O. S. U. 1945; M. D., O. S. U. 1948; Instr. 1954; Asst. Prof. 1962 -

BREDEMEYER, HANS G.
M. D., U. of Keil, Germany 1952; M. MSc., O. S. U. 1959; Instr. 1956-61; Asst. Prof. 1961; Assoc. Prof. 1968 -

CULLER, ARTHUR M.
M. D., U. of Michigan 1926; Assoc. Prof. 1946; Prof. 1947-59; Chr. 1947-59; Prof. Emer. 1959; d. 1960

DE LA MOTTE, WALTER
M. D., Fr. Wilh. U. Germany 1936; Instr. 1953; Asst. Prof. 1962 -

HAVENER, WILLIAM H.
B. A., Wooster Coll. 1944; M. S., U. of Michigan 1953; M. D., Western Reserve U. 1948; Asst. Prof. 1954; Assoc. Prof. 1956; Prof. 1959 -; Acting Chr. 1956-59; Chr. 1959-62; Prof. 1959 -

LETSON, H. CHARLES
B. S., U. of Nebraska 1946; M. D., U. of Nebraska 1948; Instr. 1956; Asst. Prof. 1962 -

LIPETZ, LEO E.
B. E. E., Cornell U. 1942; Ph. D., U. of California 1953; Instr. 1954; Asst. Prof. 1955-64

LONG, JAMES W.
B. S., O. S. U. 1930; M. D., O. S. U. 1932; Instr. 1952; Asst. Prof. 1964 -

LUBOW, MARTIN

B. A., U. C. L. A. 1952; M. D., U. of California 1956; Asst. Prof. 1968 -

MAGNUSON, ROBERT H.

A. B., O. S. U. 1938; M. D., O. S. U. 1941; Instr. 1948; Asst. Prof. 1955; Assoc. Prof. 1968 -

MAKLEY, TORRENCE A.

M. D., Washington U. 1943; Instr. 1948; Asst. Prof. 1951; Assoc. Prof. 1955; Prof. 1959 - ; Chr. 1963 -

MOSES, JACOB

B. S., Washington and Jefferson Coll. 1936; M. D., Western Reserve U. 1940; Instr. 1947; Asst. Prof. 1955; Assoc. Prof. 1962 -

PERRY, CLAUDE S.

A. B., Ohio Wesleyan U. 1922; M. D., Western Reserve U. 1926; Instr. 1932; Asst. Prof. 1941; Acting Chr. 1945-46; Assoc. Prof. 1946; Prof. 1960 -

QUINN, ROBERT E.

B. A., U. of Wisconsin 1933; M. D., U. of Wisconsin 1936; Instr. 1946; Asst. Prof. 1949; Assoc. Prof. 1955 -

SAGE, HARRY M., SR.

M. D., U. of Michigan 1913; Instr. 1921-22; Asst. Prof. 1941; Assoc. Prof. 1952; Emer. Assoc. Prof. 1959 -

SAGE, HARRY M., JR.

B. A., O. S. U. 1939; M. D., O. S. U. 1943; Instr. 1949; Asst. Prof. 1952 -

STINE, GEORGE J.

B. A., O. S. U. 1936; M. D., O. S. U. 1939; Instr. 1952; Asst. Prof. 1956 -

SUIE, TED

B. Sc., U. of Akron 1948; M. Sc., O. S. U. 1949; Ph. D., O. S. U. 1953; Instr. 1953; Asst. Prof. 1956; Assoc. Prof. 1959 -

## INSTRUCTORS

| | |
|---|---|
| BARTON, STANLEY L., | B. A., M. D.,: 1955- |
| BERGER, ALAN M., | B. S., M. D.,; 1962- |
| BENNETT, JAMES E., | M. D.: 1968- |
| BITONTE, JOSEPH L., | B. E. E., C. G. D. T.; 1958- |
| BITONTE, A. JOSEPH, | B. A., C. G. D. T.: 1968- |
| BURNS, JOHN A., | B. S., M. S., M. D.: 1968- |
| COOK, MARTIN J., | B. S., M. D.: 1955- |
| FARBER, SANDERS M., | B. S., M. D., : 1968- |
| GOLDBERG, JACK L., | B. S., M. D.: 1963- |
| HERBERT, I. JEAN, | Cert. 1965- |
| HIGBEE, JOHN W., | M. D.,: 1968- |
| INSEL, H. HERBERT, | M. D.: 1956- |
| JOSEPH, ALFRED L., | B. S., M. D.: 1956- |
| KITCHEN, CALVIN B., | B. A., M. D.: 1955- |
| LARSON, BERTIL F., | B. S., M. D.: 1967- |
| LEWIS, DONALD L., | B. S., M. D.,: 1963- |
| O'DAIR, ROBERT B., | B. S., M. D., : 1963- |
| OLSON, RICHARD S., | B. S., M. D.,: 1965- |
| SIMMONS, RICHARD E., | B. A., M. D., 1967- |
| SINGER, NORMA, | Cert.; 1964- |
| STEPHENS, VERNON D., | A. B., M. D.,: 1946- |
| THOMPSON, JOHN R., | B. S., M. D., 1953-54; 1955- |
| VAN FOSSEN, ALBERT W., | B. S., M. D.: 1959- |

WEINSTOCK, FRANK J., B.S., M.D.,: 1966-

WRIGHT, HARVEY D., B.S., M.D.,: 1962-